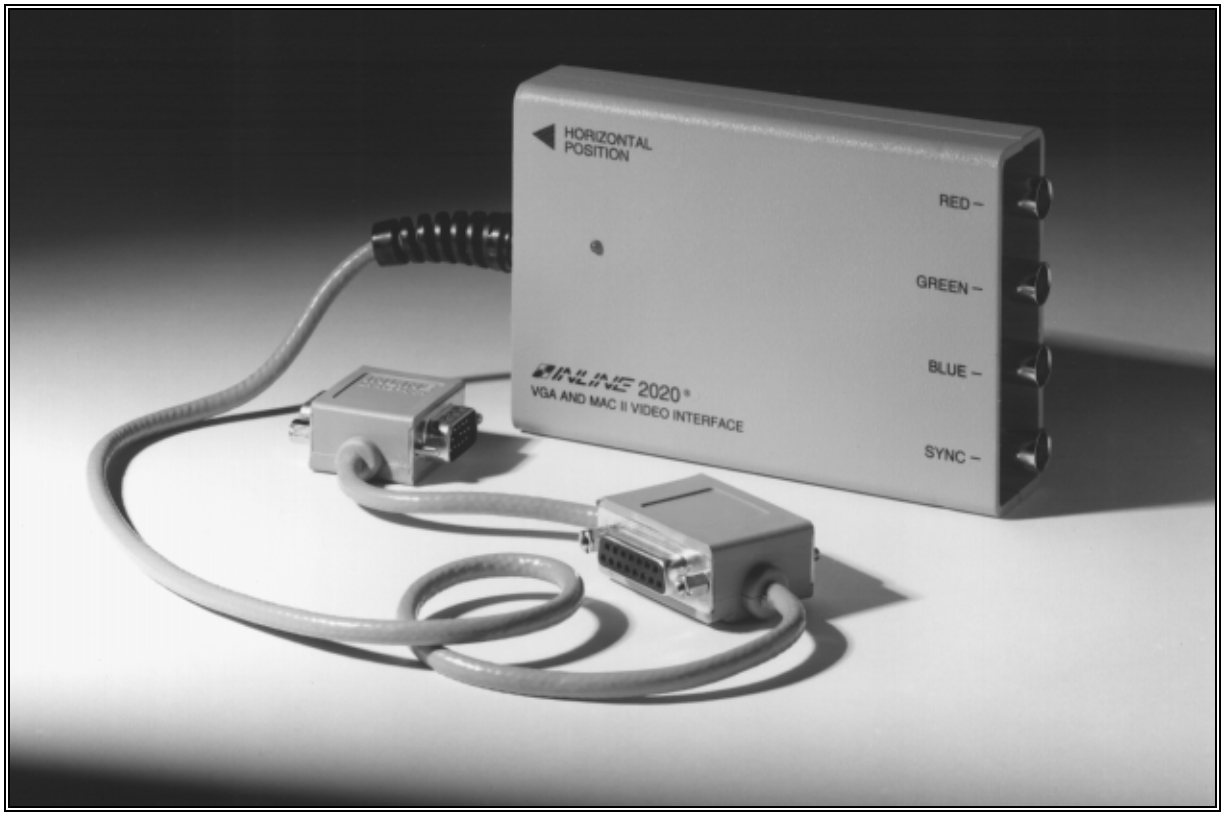
Operation Manual



IN2020 VGA / MAC II Video Interface

INLINE®

Installation and Safety Instructions

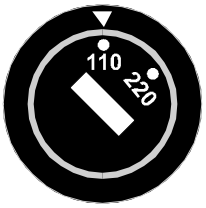
For Models without a Power Switch:

The socket outlet shall be installed near the equipment and shall be accessible.

For Models with 110 / 220V Power Selector:

Caution: Before applying power to this unit, the voltage selector must be set to the appropriate setting to match local A/C line voltage. Improper setting of the voltage selector may cause damage to the unit and create a potential fire hazard.

The voltage selector is a round switch located next to the A/C power input connector which looks like this:



Using a straight slot screwdriver or small coin, rotate the selector to the correct position so that the arrow lines up with 110 or 220 as appropriate for local power line voltage as indicated in the chart below:

Local A/C Voltage	Voltage Selector Setting
110 ~ 120 VAC	110
220 ~ 240 VAC	220

For all Models:

No serviceable parts inside the unit. Refer service to a qualified technician.

For Models with Internal or External Fuses:

For continued protection against fire hazard, replace only with same type and rating of fuse.

For IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:

Caution: Double pole / neutral fusing.

For all Models with Integral Lithium Battery:

Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Instructions d'installation et de sécurité

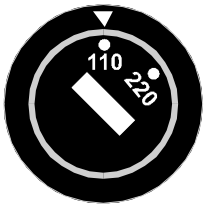
Pour les modèles sans interrupteur de courant:

La prise de courant d'alimentation sera installé près de l'équipement et sera accessible.

Pour les modèles avec un sélecteur d'alimentation 110V/220V:

Attention: Avant de connecter l'appareil au circuit d'alimentation, le sélecteur de courant doit être positionné sur la sélection appropriée correspondant au voltage du circuit de courant alternatif local. Une mauvaise sélection peut engendrer des dommages à l'appareil et créer un danger d'incendie.

Le sélecteur d'alimentation est un commutateur rond positionné près du connecteur d'alimentation. Il se représente comme suit:



A l'aide d'un tourne-vis plat ou d'une pièce de monnaie, le sélecteur peut être tourné dans la position adéquate en veillaut que la flèche corresponde avec 110 ou 220, en fonction de la valeur du circuit de courant local. (Voir tableau ci-dessous)

Circuit local AC	Position Sélecteur
110 ~ 120 VAC	110
220 ~ 240 VAC	220

Pour tout les modèles:

Pas de composants à entretenir à l'intérieur. Confiez toute réparation à un technicien qualifié.

Pour les modèles équipés de fusibles internes ou externes:

Afin d'éviter tout danger d'incendie, ne remplacer qu'avec le même type et la même valeur de fusible.

Pour IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:

Attention: Double pôle / fusible au neutre.

Pour tout les modèles avec une batterie au lithium interne:

Attention: Danger d'explosion si la batterie est incorrectement remplacée. Ne remplacez la batterie qu'avec le même modèle, ou avec un modèle recommandé par le constructeur. Traitez les batteries usagées selon les instructions du fabricant, ou selon les normes écologiques en viguer.

Installations und Sicherheitshinweise

Für Geräte ohne Netzschalter:
Die Netzsteckdose soll in de Nähe des Gerätes installiert und frei zugänglich sein.

Für Geräte mit 110 / 220V Spannungswähler:

Achtung: Bevor Sie dem Gerät Spann ung zuführen, muß der Spannungswähler entsprechend der Spannung des lokalen Wechselspannungsnetzes eingestellt werden. Die falsche Stellung des Spannungswählers kann eine Beschädigung des Gerätes und möglicherweise ein Feuer verursachen.

Der Spannungswähler ist ein runder Schalter in der Nähe der Netzeingangsbuchse mit folgendem Aussehen:

Drehen Sie den Wähler mit einem normalen Schraubenzieher oder einer kleinen Münze so, daß der Pfeil auf die 110 oder 220 zeigt, entsprechend der Spannung Ihr es lokalen Netzes wie hier angezeigt:

Lokale Netzwechselspannung	Stellung des Spannungswählers
110 ~ 120 V	110
220 ~ 240 V	220

Für alle Geräte:
Keine Wartung innerhalb des Gerätes notwendig. Reparaturen nur durch einen Fachmann!

Für Geräte mit interner oder externer Sicherung:
Für dauernden Schutz gegen Feuergefahr darf die Sicherung nur gegen eine andere gleichen Typs und gleicher Nennleistung ausgewechselt werden.

Für IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:
Achtung: Allpolige Absicherung

Für alle Geräte mit eingebauter Lithium Batterie:
Achtung: Explosionsgefahr bei falschem Batterieeinsatz. Batterie nur erstzen durch den gleichen oder entsprechenden Typ wie vom Hersteller empfohlen. Entsorgung verbrauchter Batterien nur nach den Anweisungen des Herstellers.

Instalacion E Instrucciones de Seguridad

Modelos Sin Interruptor:
La conexión debe ser instalada cerca del equipo y debe ser accesible.

Modelos con Selector de Voltaje de 110/220V:
Precaución: Antes de operar esta unidad, el selector de voltaje debe instalarse de forma que corresponda a la linea de voltaje local. Instalación inadecuada del selector de voltaje puede causar daño a la unidad y originar un incendio.

El selector de voltaje es un cambia vía redondo localizado cerca de la conexión electrica, como se ve en el dibujo:

Use un destornillador comun o una moneda pequeña, mueva el selector a la posición correcta, de forma que las flechas indiquen 110 o 220 de acuerdo con el voltaje local, como esta indicado a continuación.

Voltaje Local A/C	Selector de Voltaje
110 ~ 120 VAC	110
220 ~ 240 VAC	220

Para Todos Los Modelos:
Dentro de la unidad , no hay partes para reparar. Llame un tecnico calificado.

Modelos con Fusibles Internos o Externos:
Para prevenir un incendio, reemplace solo con el mismo tipo de fusible.

Modelos IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:
Precaución: Double Polo / Fusible Neutral.

Modelos con Bateria de Lithiun Interna:
Precaución: Peligro de explosión si la batería es reemplacada incorrectamente. Reemplace solamente con la misma clase de batería, o una equivalente recomendada por el fabricante. Deseche las baterías usadas de acuerdo con las instrucciones del fabricante.

CE COMPLIANCE

All products exported to Europe by Inline, Inc. after January 1, 1997 have been tested and found to comply with EU Council Directive 89/336/EEC. These devices conform to the following standards:

EN50081-1 (1991), EN55022 (1987)
EN50082-1 (1992 and 1994), EN60950-92

Shielded interconnect cables must be employed with this equipment to ensure compliance with the pertinent Electromagnetic Interference (EMI) and Electromagnetic Compatibility (EMC) standards governing this device.

CE

FCC COMPLIANCE

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide against harmful interference when equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

DESCRIPTION

The **IN2020** is a dedicated computer video interface for VGA and MAC II type computer video signals. Like other INLINE interfaces, the **IN2020** carries out two primary functions. The first function is signal splitting since the interface allows for the simultaneous connection and viewing of both the computer's local monitor and a large screen data projector or monitor. The second function is physical and electronic interfacing. The IN2020 takes in either a VGA or MAC II type video signal and provides an output signal in the most convenient format, RGBS on four BNC connectors. The **IN2020** computer video interface is fully automatic (it has no internal controls or dip switches), offering easy operation and the following features:

- Horizontal position control - allows picture to be centered precisely on the data display screen
- Dual head input cable for connection to VGA or MAC II computer graphic cards
- Automatic termination of unused local monitor loop-through outputs
- Rugged metal enclosure
- 100 MHz bandwidth

INPUT COMPATIBILITY

The **IN2020** interface will accept analog video signals with horizontal scan frequencies between 15.7 KHz and 78.0 KHz as detailed below.

VGA TYPE SIGNALS

The **IN2020** operates with a wide variety of IBM and compatible computer video signal formats including VGA, SVGA, XGA, and 8514A. The **IN2020** may also be used with a monochrome local monitor if an **IN9030** monochrome monitor adapter is used.

MAC II TYPE SIGNALS

The **IN2020** operates with most Apple computers including:
-- MAC II, MAC IIci, MAC IIcx, MAC IIfx, MAC IIsi, MAC IIx, MAC LC, MAC IIvx, Quadra, Centris, Performa, and other models with similar signals.
-- Third party video cards from manufacturers such as Raster Ops and Super Mac which use a compatible RGBS signal on a 15 pin D output connector.
-- Other Apple computers such as the Apple IIGS and Powerbooks which feature a 15 pin D video output connector. Please note that certain models of the Apple Powerbook do not normally provide a video output signal and require a third party video output adapter to drive an external video display device.

OUTPUT COMPATIBILITY

The **IN2020** outputs an RGBS format signal (Red, Green, Blue, and composite sync) on four BNC connectors when used with VGA type signals and most MACII type signals. The output signal is compatible with many data projectors and monitors. VGA and MACII type video cards operate in several different modes encompassing a wide range of resolutions and horizontal scan rates. The **IN2020** is not a scan converter and the data projector or monitor must be compatible with the horizontal scan rate put out by the computer video card. Please check the documentation for both the computer video card and the data projection device in order to ensure compatibility.

INSTALLATION

This section offers step-by-step instructions for installing and adjusting the **IN2020.** A detailed application drawing showing all equipment connections is included on the next page (diagram shows VGA computer connections).

1. Turn the computer and computer monitor off. Disconnect the computer monitor (if present) from the video output port on your computer.

2. Connect the **male side** of the appropriate input connector to the computer's video output port:
   VGA computers - use the 15 pin HD connector located on the end of the loop cable.
   MAC computers - use the 15 pin D connector located in the middle of the input cable.

NOTE: Only one computer at a time may be attached to the IN2020. The interface is designed to work with either VGA or MAC II type computers, but not if both are attached simultaneously.

3. Connect the local computer monitor (if present) to the **female side** of the same pass-through connector. If no local monitor is used, the **IN2020** will automatically terminate the unused output (for more information about auto-termination conditions, please see page 4).

   When using a monochrome VGA local monitor, an **IN9030** monochrome monitor adapter must be inserted between the monitor cable and the female side of the pass-through connector.

4. Connect the **IN2020** RGBS output (4 BNC connectors) to the data display device's RGBS input, using four high resolution BNC cables or a multi-conductor RGBS "snake". The **IN7000, IN7100,** and **IN7600** series high resolution cables are well suited for this purpose. Take care while making connections to insure that the red output is connected to the red input, green output to the green input, etc.

5. Connect the round connector on the 9V 500 mA power supply to the POWER input jack (located on the end panel of the interface, on the same side as the horizontal position control and monitor loop cable.) Connect the power adapter box side of the power supply to the A/C power source. The green top panel **POWER** indicator should light after power has been applied to the unit.

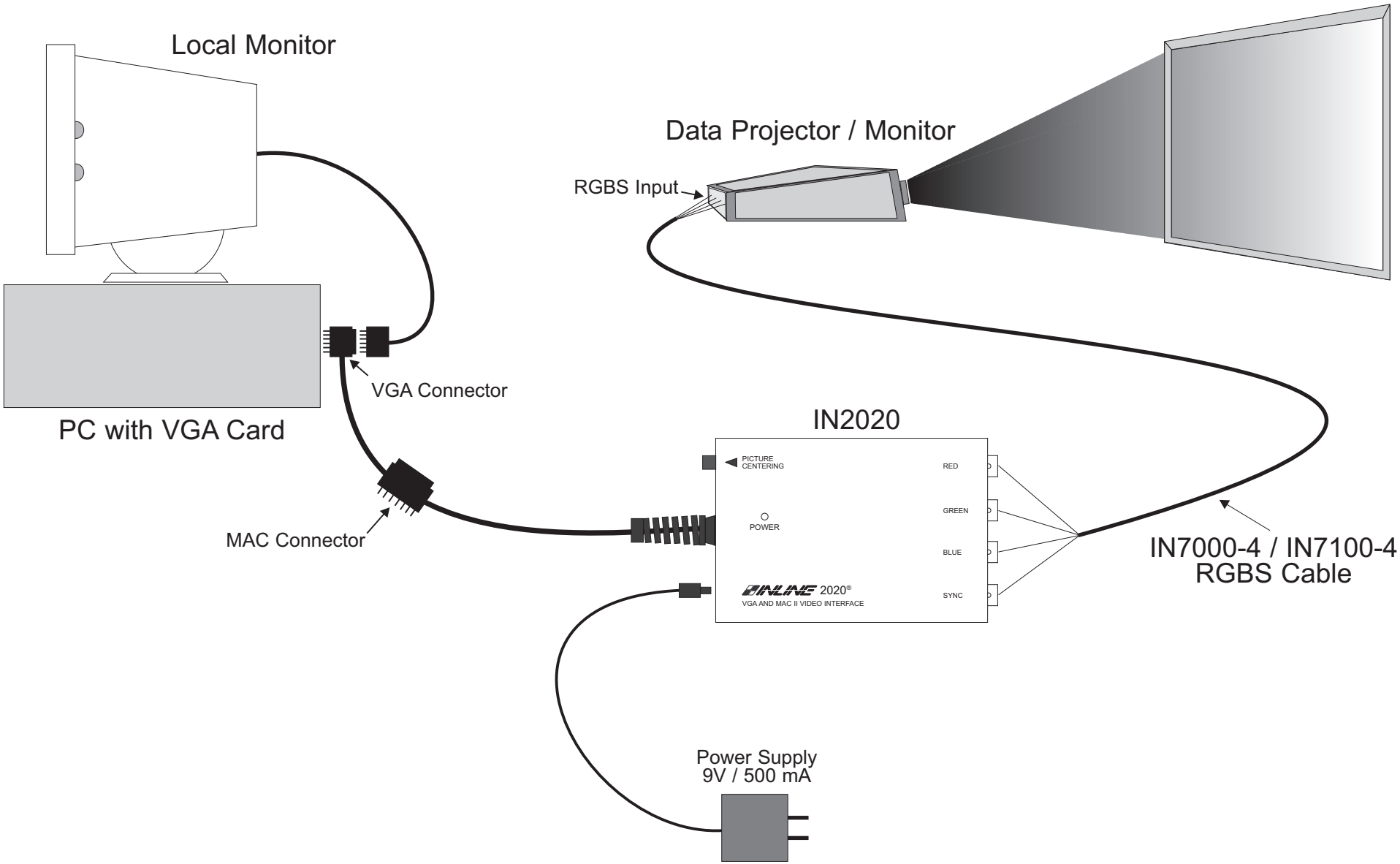
6. Complete the installation by turning the computer and computer monitor on. If required, adjust the horizontal position control as detailed in the following section.

HORIZONTAL POSITION CONTROL

The horizontal position control adjusts the position of the image on the data display device from left to right (it has no effect on the local computer monitor). Many data projectors and monitors have their own horizontal position control, and the interaction of the display device's horizontal control and the interface's horizontal control may result in a dark image on the data display. The following procedure is suggested to ensure best results:

1. Adjust the **IN2020** horizontal position control so a good quality image is displayed. This control should not be set to an extreme position.
2. Adjust the display device horizontal position control until the image is centered as desired.
3. If the image appears dark or the colors are not properly displayed, fine tune the controls on both the display device and the **IN2020** until the picture is centered and a good quality image is attained.

Application Diagram IN2020



AUTO-TERMINATION

Most interfaces for analog computer video signals require the use of a termination plug when no local monitor is present. The **IN2020** features an auto-termination circuit which senses when a monitor is not attached, then automatically applies a 75 ohm termination to the RGB video signals and grounds the appropriate sense pins, making termination plugs unnecessary.

VGA

The **IN2020** looks for a ground on pin #10. If a ground is present, the unit knows that a local monitor is connected and does not terminate the signal. If there is no ground on pin #10, the unit internally terminates the RGB signals and grounds pin #11 (ID bit 0).

MAC II

The **IN2020** looks for a ground on pin #1. If a ground is present, the unit knows that a local monitor is connected, and it applies no termination. If there is no ground on pin #1, the unit internally terminates the RGB signals and grounds pin #4 (sense pin #1). This emulates an Apple 13" monitor and forces the computer to boot up in the 640 x 480 / 35 KHz mode. Users who need to have the computer operate at a different resolution must either attach the appropriate Apple monitor to the output loop-through connector or use a special monitor emulation termination plug.

SPECIFICATIONS

INPUTS

Connectors:	VGA - 15 Pin HD Male MAC - 15 Pin D Male
RGB Signals:	Analog Video, 0 - 1.2 V p-p
Sync Signals:	TTL or Analog, 2v - 5v p-p VGA - Separate Horizontal and Vertical Sync MAC - Composite Sync (unit will not strip sync off green)

OUTPUTS

Connectors:	4 - BNC Connectors for Red, Green, Blue, Sync
RGB Signals:	Analog Video
RGB Gain:	Fixed at 1.1
Bandwidth:	100 MHz @ -3dB
Sync Signals:	AGC 4V p-p into high impedance loads 2V p-p into low impedance loads
Sync Pulse Width:	Horizontal 2.5 ❍sec from 15 - 39 KHz 1.2 ❍sec from 40 to 78 KHz Vertical 180 - 200 ❍sec at all frequencies

DIMENSIONS

Size:	4.75" x 3.25" x 1.12"
Weight:	1 lb
Power Supply:	9V 500 mA

TROUBLESHOOTING

The display device connected to the RGBS output has a bad/scrambled image.

Solution 1: The display device connected to the output of the **IN2020** may not be compatible with the computer output. VGA runs at 31.5 KHz, but SVGA can be as high as 48 - 58 KHz! MACII/Quadra computers sense what monitor is connected and configure themselves accordingly, with horizontal scan rates ranging from 24.48 to 68.9 KHz.

Solution 2: The RGBS cable may have a bad sync line. Try running the sync through another cable.

The output image is very dark.

Solution: The horizontal position control may be set off to an extreme position or may be interacting poorly with the horizontal position control on the display device. Follow the horizontal position adjustment procedure listed on page 2.

The local monitor and data projector/monitor are both displaying a dark image.

Solution: The **IN2020** is not recognizing the presence of the local monitor so it is internally terminating, causing a double termination. The **IN2020** is looking for a ground on pin 10 for VGA and
pin 1 for MACII. Make sure the monitor's cable provides this ground - an adapter may be necessary to provide the ground.

When interfacing a VGA signal, the output image is violet with a very low green signal.

Solution: The local monitor may be monochrome. If it is a monochrome monitor, the **IN9030** mono adapter must be used - the output of the **IN2020** will be black and white.

The output image is missing a color.

Solution: Possibly the RGBS cable is bad. Try switching connections on the output to verify that the bad color's cable is OK (***Example***: If there is no red, try running the green output through the red cable and see if green is displayed or not.)

The output image is too green.

Solution: Some MACII and Quadra computers output an RGsBS signal. The **IN2020** does not strip the sync off of the green in these situations and still outputs an RGsBS signal. One solution would be to disconnect the sync channel (if the display will work with sync on green). If the display device absolutely needs RGBS, an **IN2081** or an **IN2000** and **IN5104A** cable should be used.

The output of the IN2020 is OK, but the local monitor does not work.

Solution: You may be trying to use a VGA monitor with a MACII computer or vice-versa. The local monitor must work in conjunction with the input being used. The input cable of the **IN2020** is <u>not</u> a VGA to MAC adapter.

Output image is ghosting.

Solution: The **IN2020** is designed to plug directly into the computer's graphic card and a short (6 to 12 ft) monitor cable attached to the loop through output. An extension cable for the input or a very long monitor cable may cause this problem.

WARRANTY

- INLINE warrants the equipment it manufactures to be free from defects in materials and workmanship.

- If equipment fails because of such defects and INLINE is notified within two (2) years from the date of shipment, INLINE will, at its option, repair or replace the equipment at its plant, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications.

- Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of re-shipment to the Buyer.

- **This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantibility or fitness for any particular purpose, all of which are expressly disclaimed.**

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